# INVESTIGATION OF THE SEPARATION DEPENDENT FLUORESCENCE RESONANT ENERGY TRANSFER BETWEEN CDSE/ZNS QUANTUM DOTS BY NEAR-FIELD SCANNING OPTICAL MICROSCOPY

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| CCD: | Charged Coupled Device |
| QDs: | Quantum Dots |
| NSOM: | Near-field Scanning Optical Microscope |
| FRET: | Förster Resonant Energy Transfer |
| PL: | Photoluminescence |

ABSTRACT

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INVESTIGATION OF THE SEPARATION DEPENDENT FLUORESCENCE RESONANT ENERGY TRANSFER BETWEEN CDSE/ZNS QUANTUM DOTS BY NEAR-FIELD SCANNING OPTICAL MICROSCOPY

A Near-field Scanning Optical Microscope (NSOM) is used to study the resonant energy transfer between different size CdSe/ZnS quantum dots (QDs). The NSOM system is used to bring the small QDs which are 6 nm in diameter close to 8 nm diameter QDs which are embed with PMMA on a cover glass. The PMMA is used to prevent the 8 nm QDs from aggregation, which allows us to locate one dot on the cover slide and have the potential to get the interaction of two individual dots. A systematic methodology is used to localize a single QD on the cover glass and align the small and large QDs. Since the ground energy state of the small QDs match the excitation energy level of the large QDs. When the small dots get excited, part of the energy transfers to the large QDs. As the separation between small and large QDs is changed in near-field range (20-50nm), the transition probability is observed, indicating that the FRET level changes as a function of separation between small and large QDs. Possible future improvements are also discussed.

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